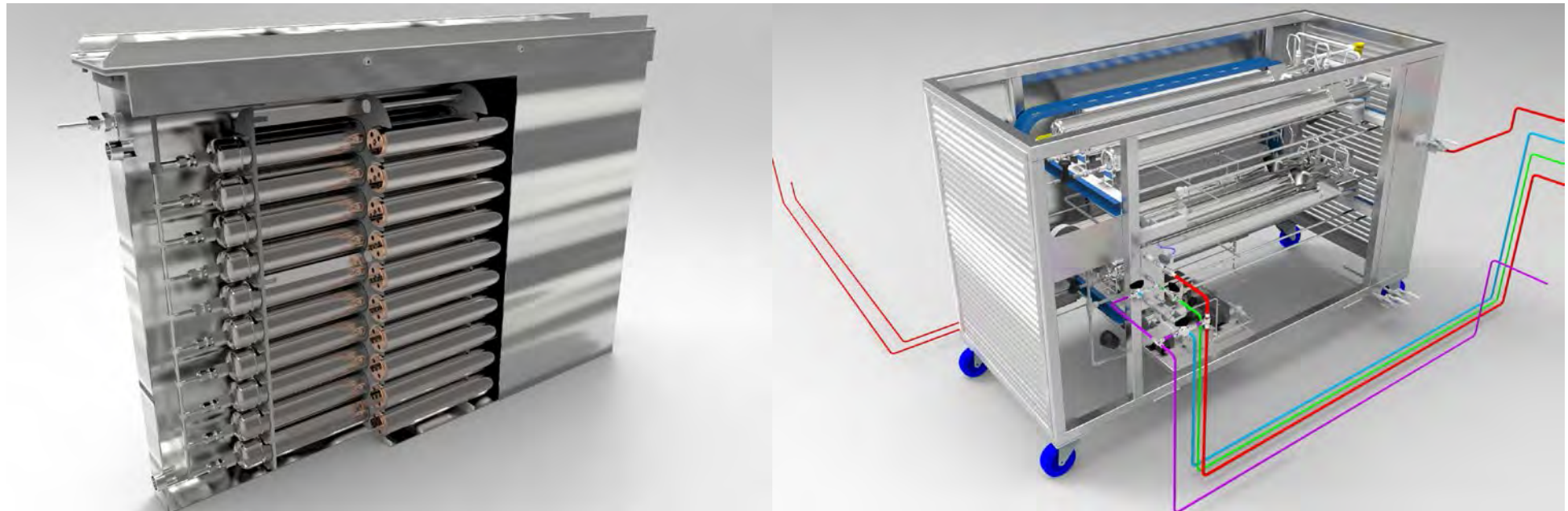


TF DESIGN ENGINEERING



PRESENTED BY: GERHARD LOUW

Thermodynamics Fluids & Design
Tel: +27 21 887 9288 | Fax: +27 21 887 9899 | Mail: info@tfdesign.co.za

TF DESIGN – Your Engineering Partner

- Founded in 1993 and is based in Stellenbosch, South Africa
- Employee complement: 160 people [TF Design & TF Design Manufacturing]
- TF Design specialises in the fields of Heat Transfer & Thermodynamics, but, are also strongly involved in turnkey Mechanical / Electrical projects.
- TF Design is able to design from first principals and can therefore offer unique solutions.

TF DESIGN – YOUR ENGINEERING PARTNER



TF DESIGN ENGINEERING

TF DESIGN, STELLENBOSCH

MECHANICAL PERSONNEL

30 x Mechanical Engineers

20 x Technical personnel

30 x Skilled and Semi skilled artisans, welders, fitters etc.

ELECTRICAL PERSONNEL

12 x Electrical Engineers

5 x Technical personnel

10 x Skilled Labourers

9 x Internships

TF DESIGN MANUFACTURING, SOMERSET WEST

4 x Mechanical Engineers

40 x Skilled and Semi skilled artisans, welders, fitters etc.

2 x Laser Cutter, 1 x Plasma Cutter, CNC Benders, Rollers, Welders & fully operation workshop for heavy steel construction.

TF DESIGN – Serviced Industries

- Automotive
- Defense / Military
- Chemical
- Medical
- Power Generation
- Timber
- Mobile Containerized Systems
- Building Industry – HVAC Systems
- Technology Development





TF DESIGN – Partnership



UNIVERSITY *of the*
WESTERN CAPE



- Provide novel concepts and idea's
- Putting these novel concepts and idea's into practise
- Ensure compliance with statutory requirements
- Systems Integrator for high performance systems



TF DESIGN – MH High Pressure Vessels

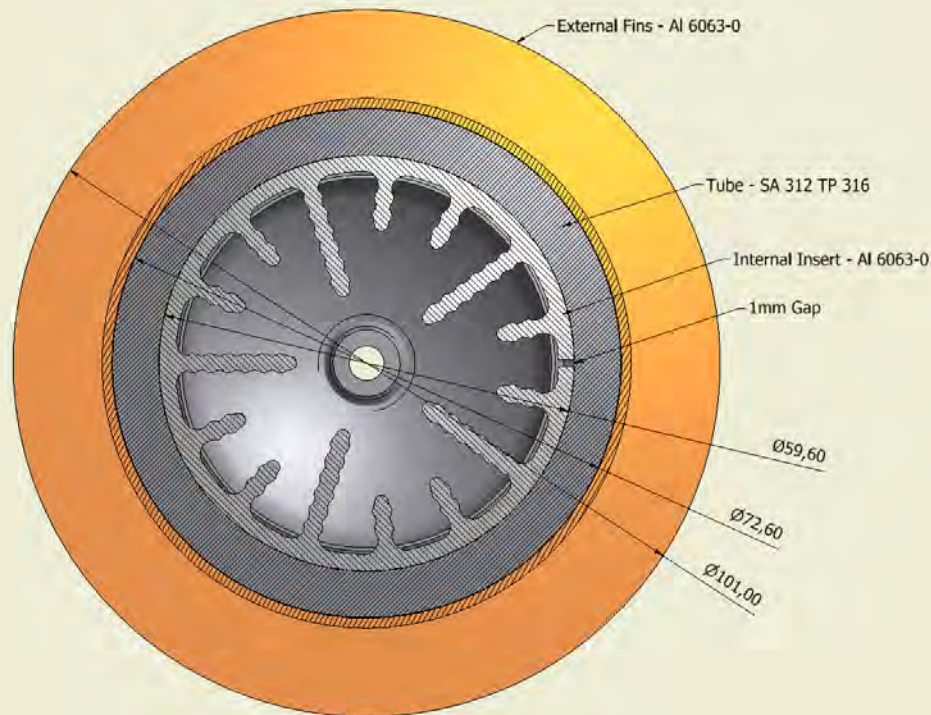


- Design according to ASME Boiler & Pressure vessel standards
- NDT (Non-destructive Test)
- X-ray Test
- Dye Pen Test
- Hydrostatic Pressure Tests

TF DESIGN – Earlier Design Vessels (11-161)



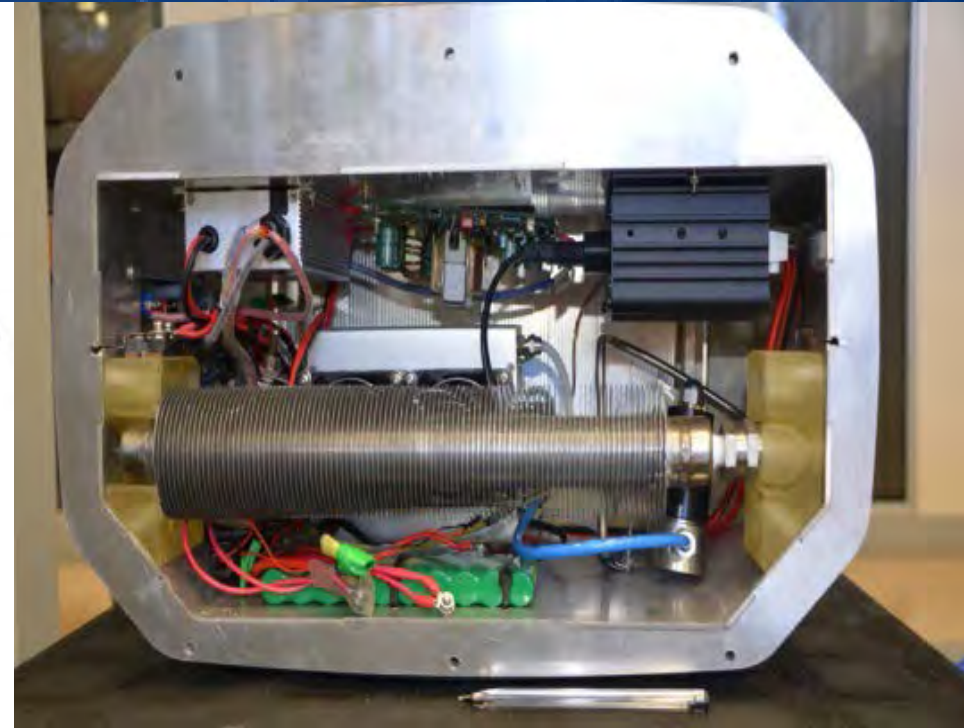
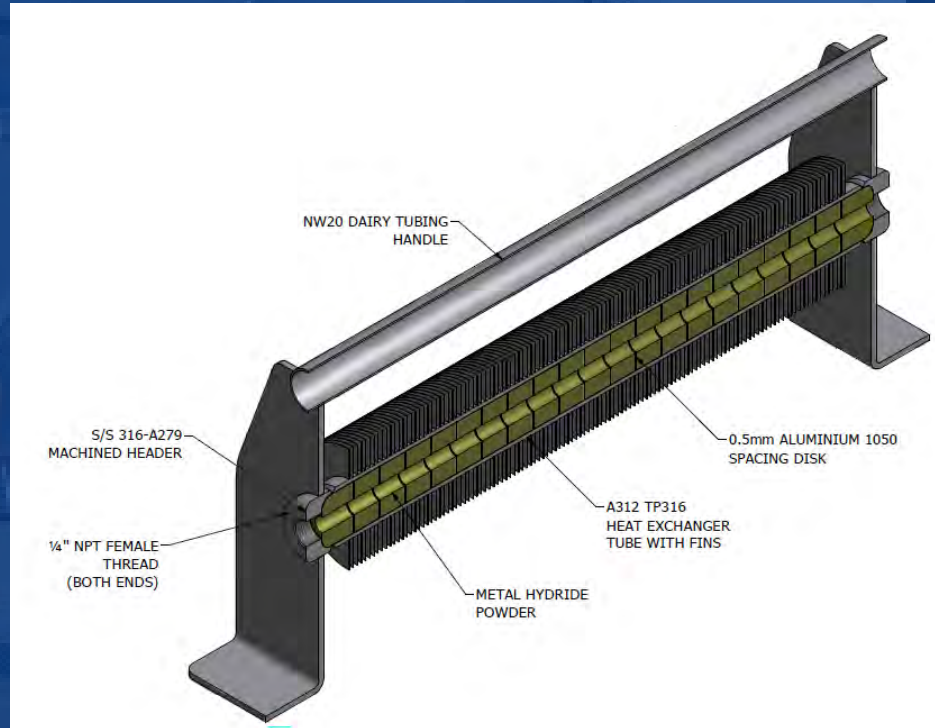
- Aluminum Extruded insert
- Mobile Fuel Cell Scooter
- $P = 200 \text{ bar}$
- $T = -50^{\circ}\text{C}$ to 150°C



TF DESIGN – Earlier Design Vessels (12-133)



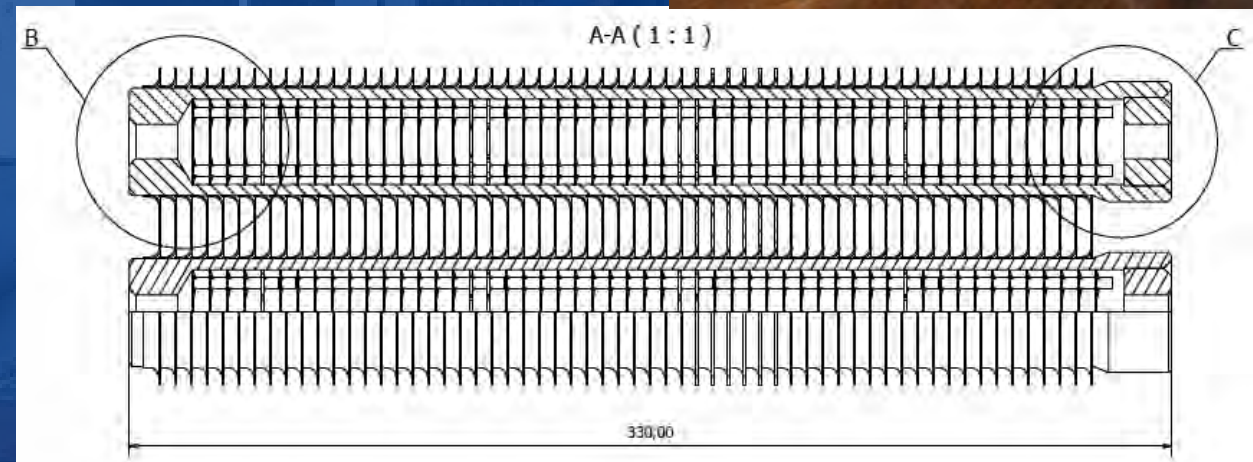
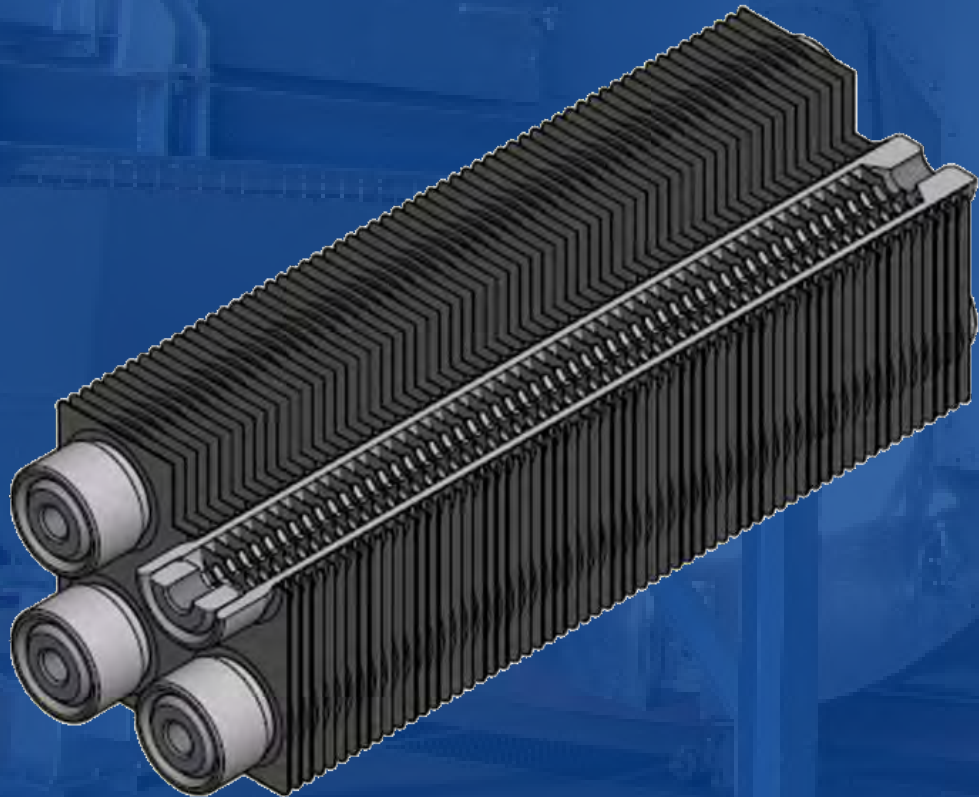
- MH - Graphite Mixture
 - Round Aluminium spacers inserts
 - Portable Fuel Cell Charger
- $V = 165,763 \text{ ml}$



TF DESIGN – Earlier Design Vessels (12-184)



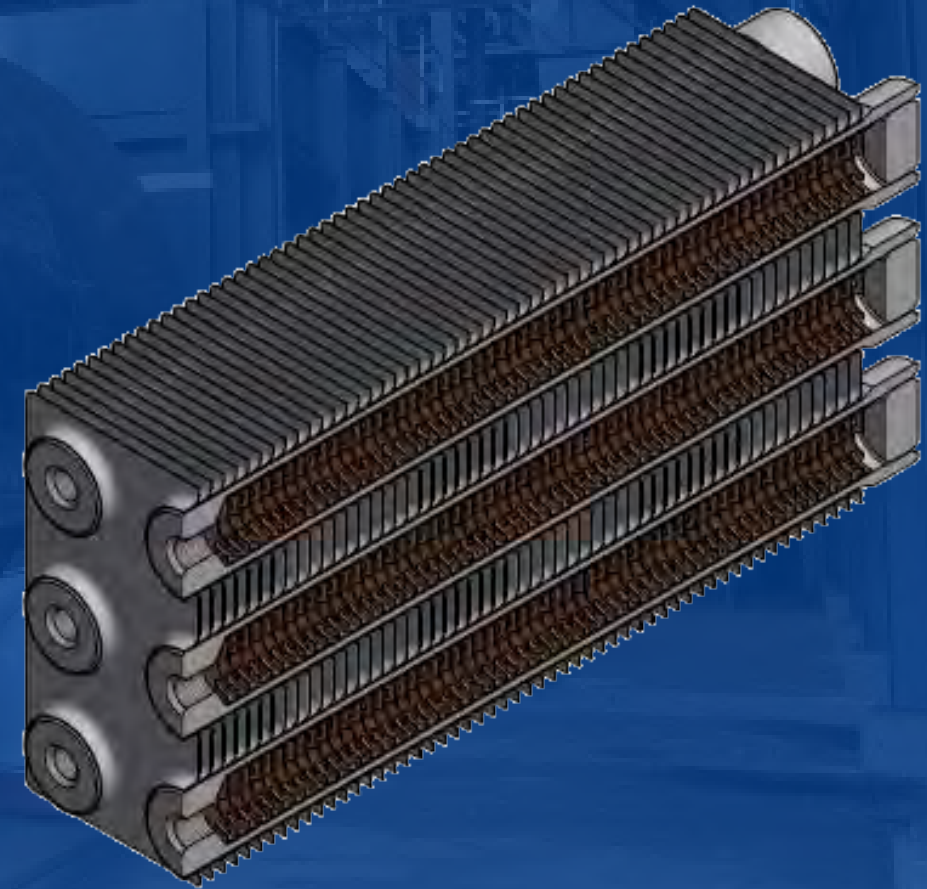
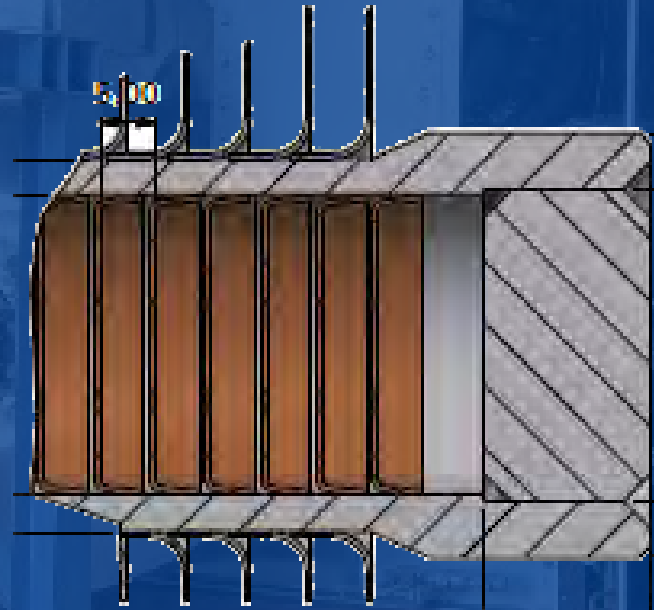
- 4 Pack Configuration
- Internal and external Aluminium Fins (0.5mm thick at 5mm spacing)
- Dimensions: 330 x 100 x 100 mm



TF DESIGN – Earlier Design Vessels (13-159)



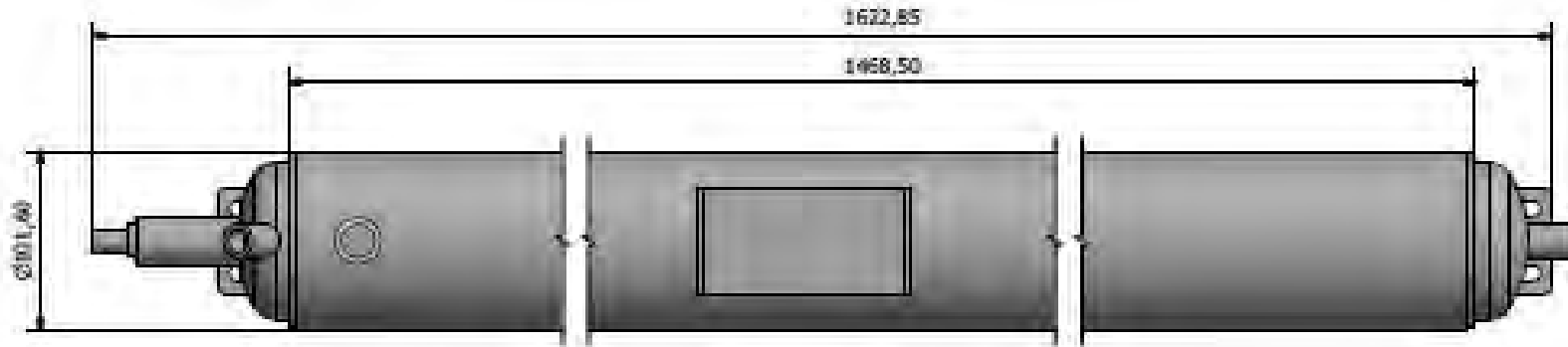
- 6 Pack Configuration
- Internal Copper spacers
- External Aluminium Fins
- Dimensions: 330 x 154 x 100 mm



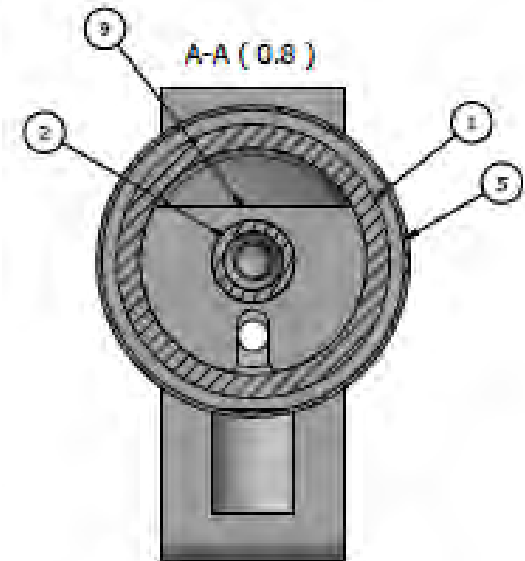
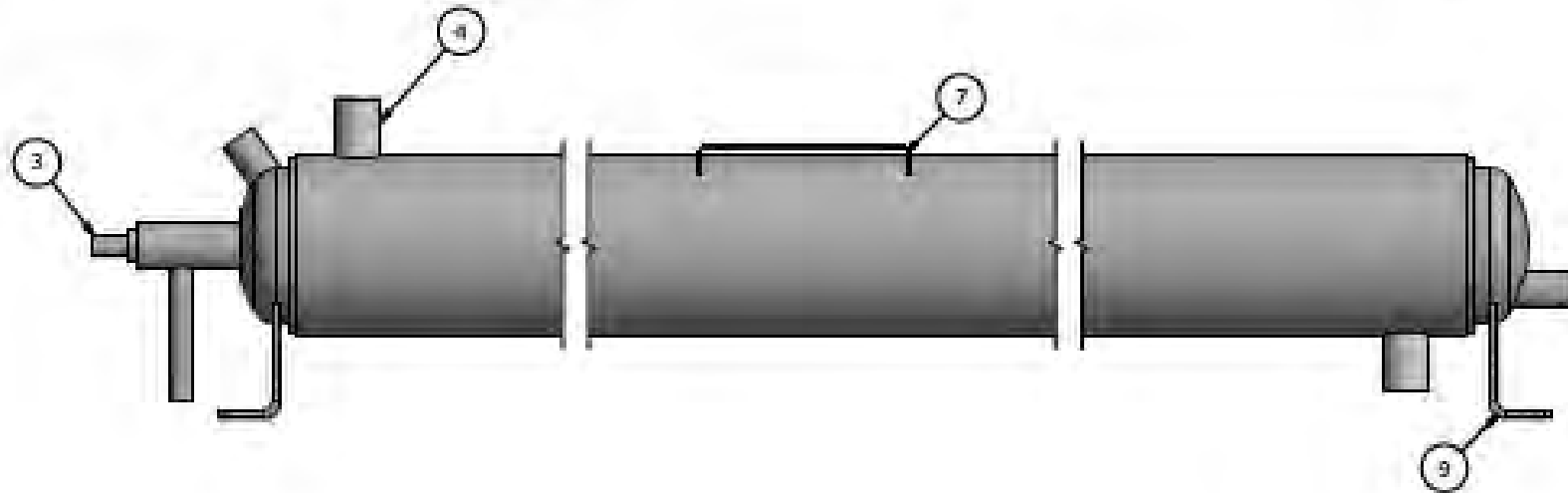
TF DESIGN – Impala H₂ Refueling Station



Compressor Vessel Design



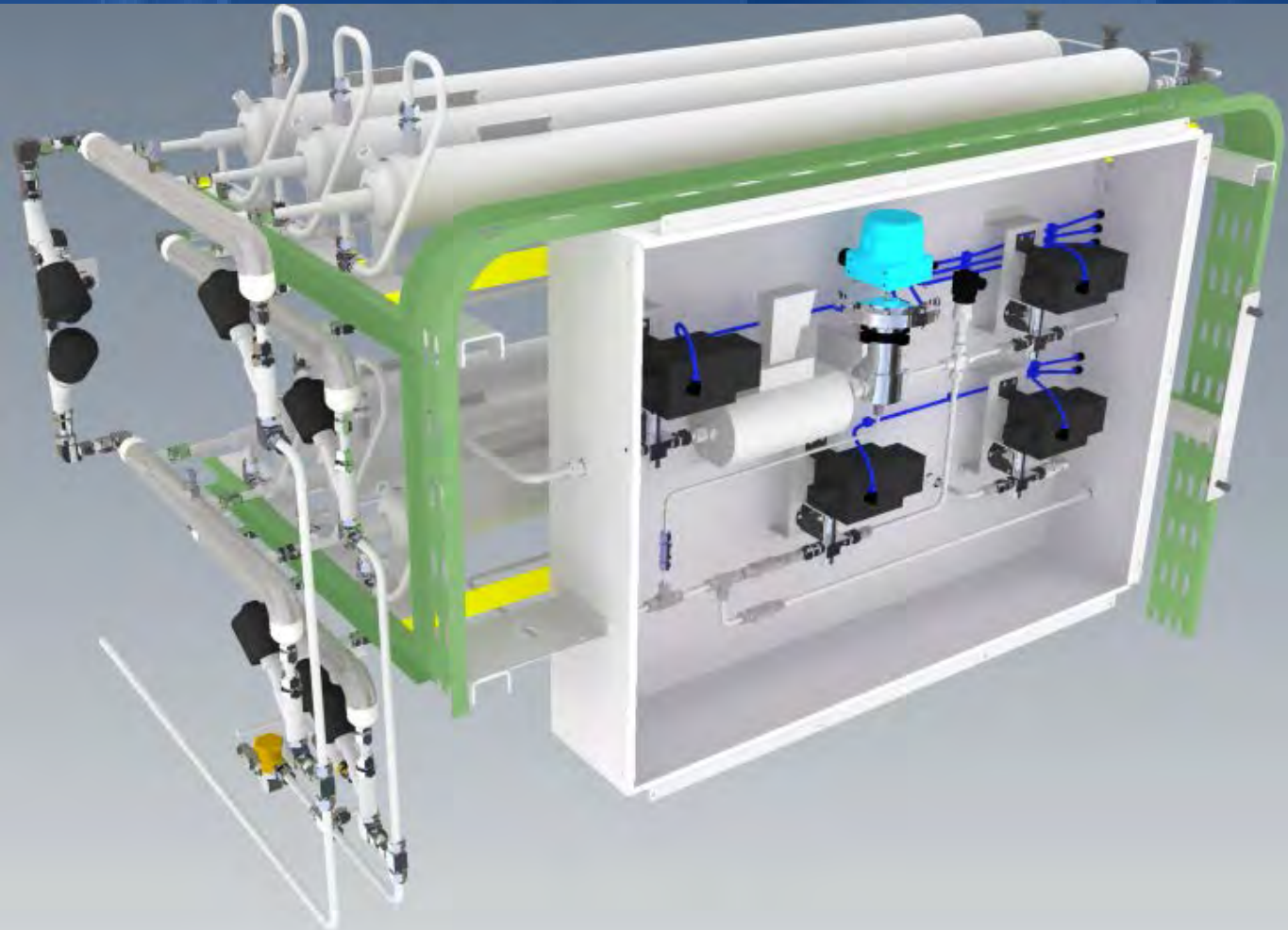
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	14036-001-000-001	VESSEL WELDED ASSEMBLY
2	1	14036-001-000-004	FINNED TUBE
3	1	14036-001-000-007	FIN TUBE STEAM IN/WATER OUT
4	1	14036-001-000-008	JACKET STEAM IN/WATER OUT
5	1	14036-001-000-010	OUTSIDE STEAM JACKET
6	2	14036-001-000-009	OUTSIDE JACKET SIDE FLANGE
7	1	14036-001-000-014	DATA PLATE
8	2	14036-001-000-015	FOOT BRACKET
9	1	14036-001-000-017	FIN TUBE SUPPORT



TF DESIGN – Impala H₂ Refueling Station



Compressor Design



TF DESIGN – Impala H₂ Refueling Station



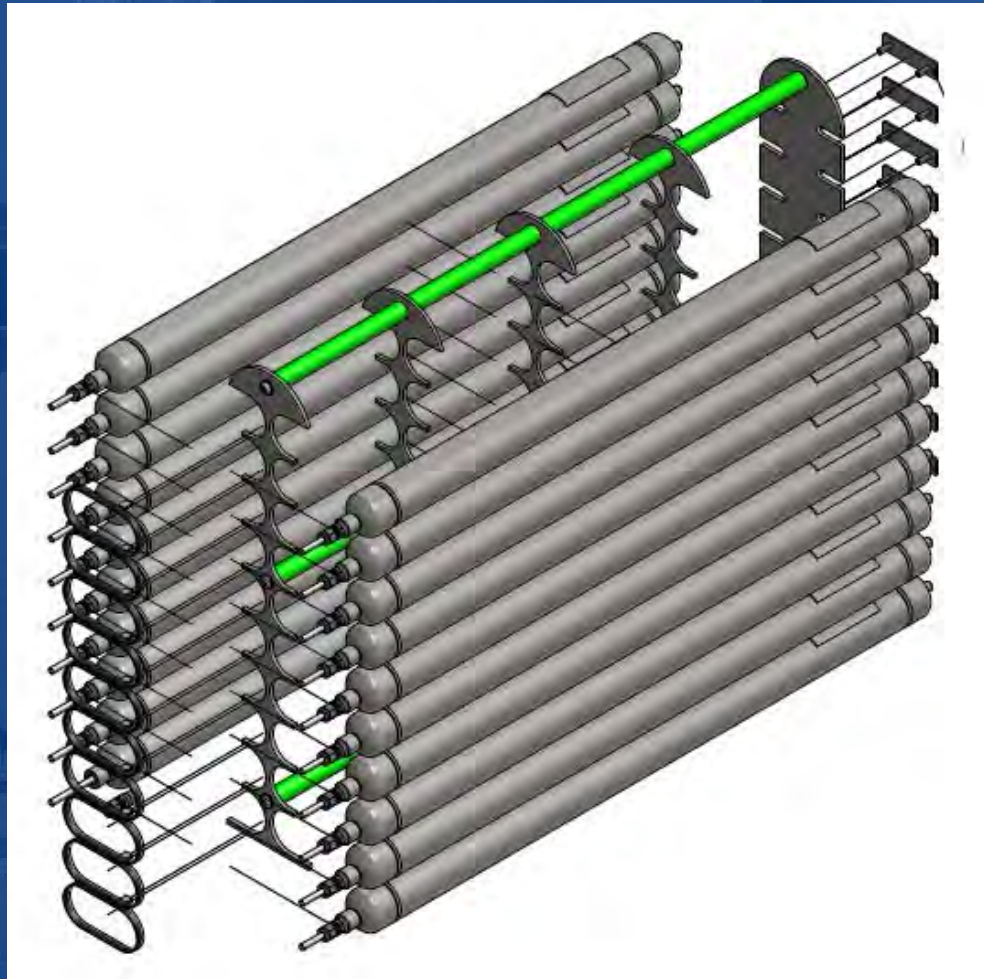
Refuelling



TF DESIGN – Impala H₂ Refueling Station



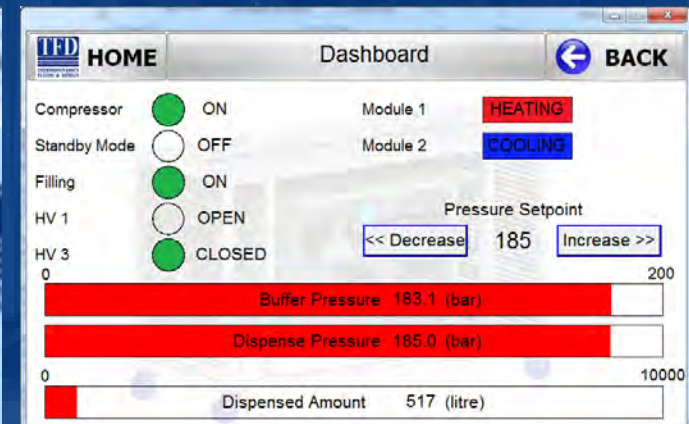
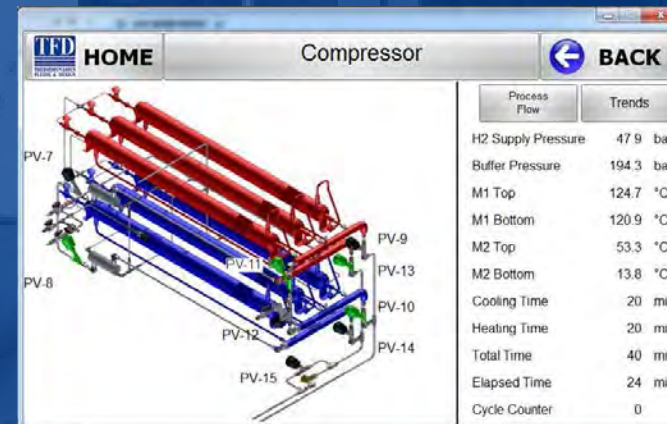
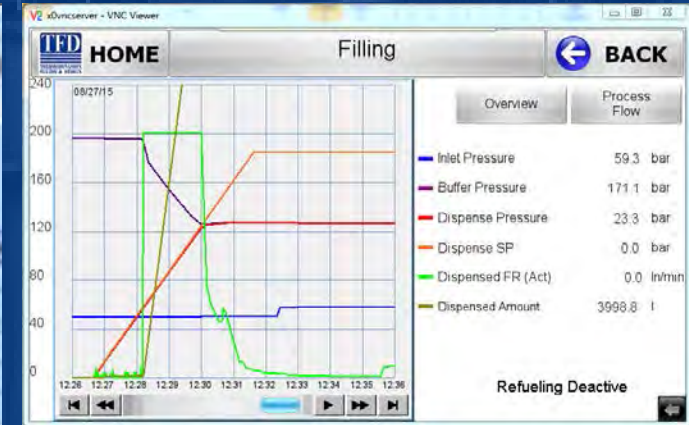
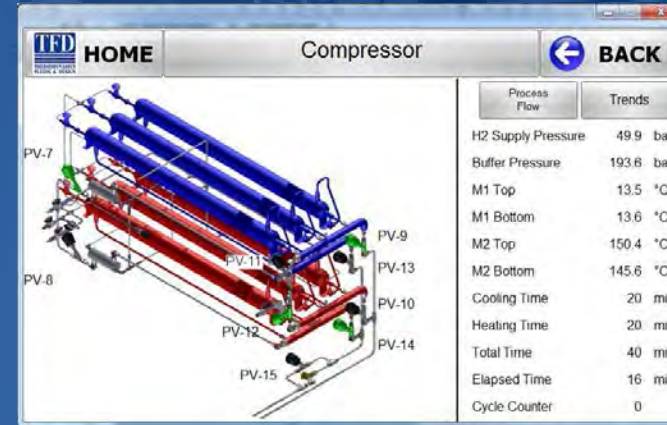
Forklift Vessels



TF DESIGN – Impala H₂ Refueling Station



Electrical

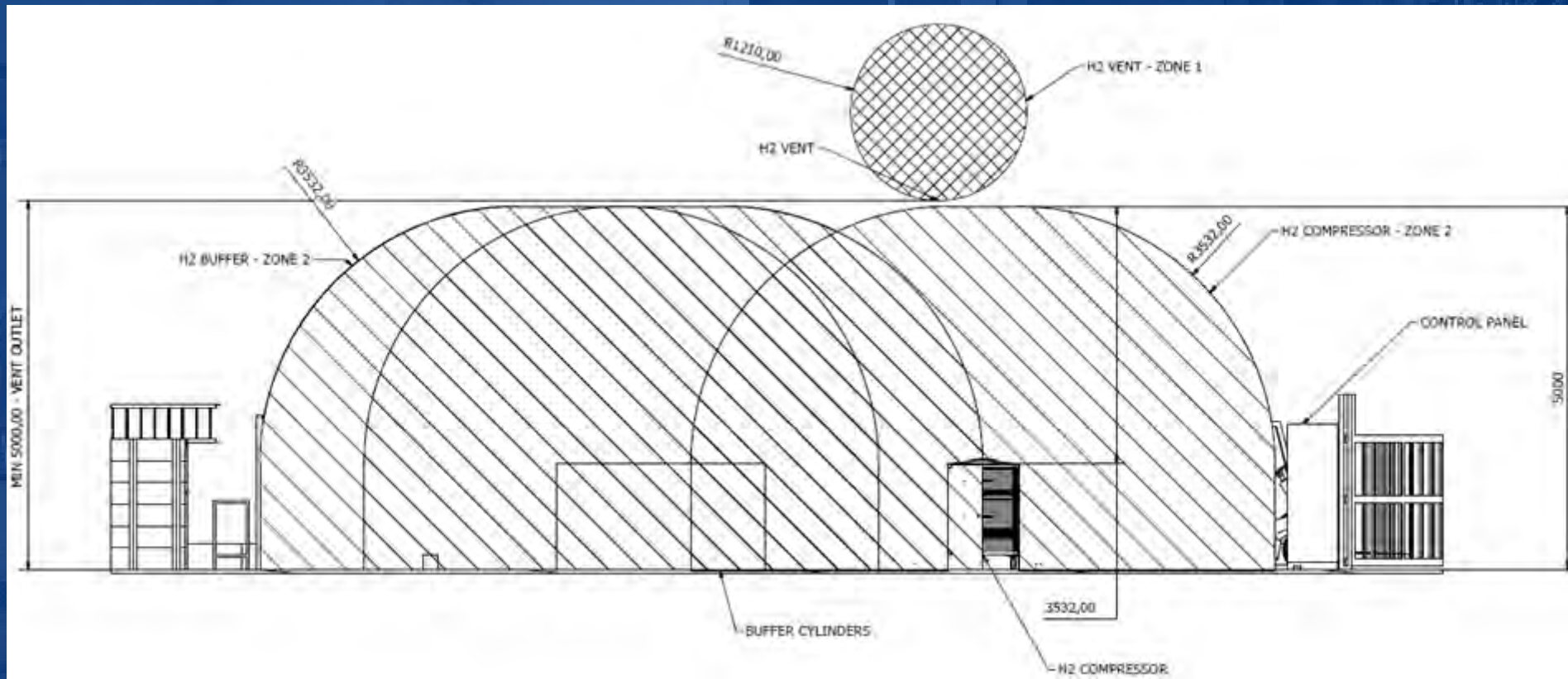




TF DESIGN – Impala H₂ Refueling Station

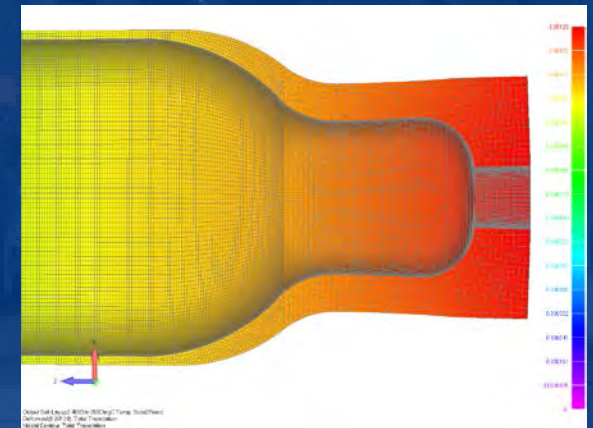
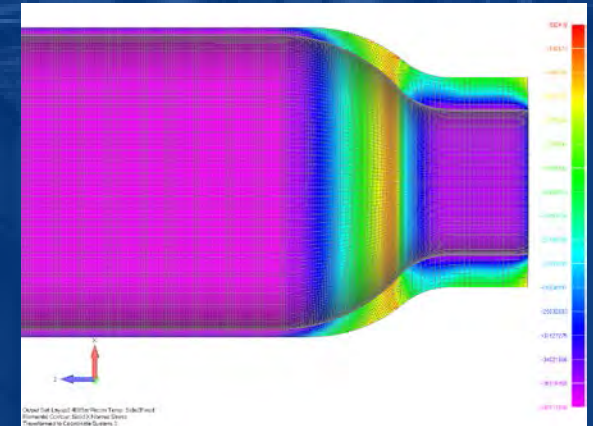
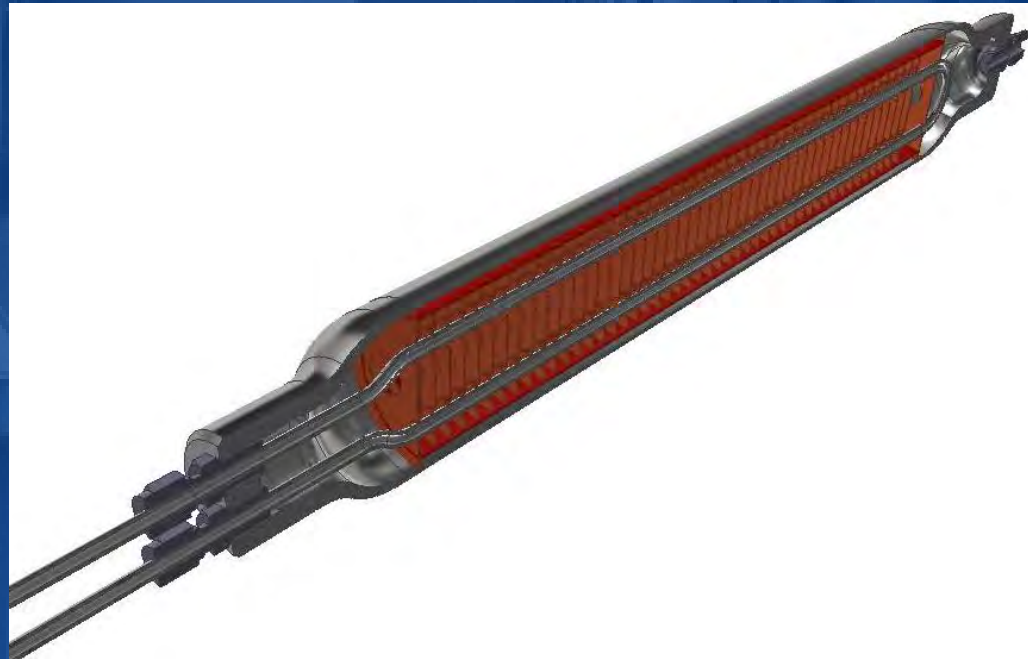
Zone Classification

- Design according to IEC 60079-10-1:2008 and SANS 10108:2005





TF DESIGN – Fibre Wound Vessel



TF DESIGN – Your Engineering Partner



Thank You